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DISEASES OF THE NERVOUS SYSTEM

A PRACTICAL JOURNAL ON PSYCHIATRY AND NEUROLOGY

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DISEASES of the NERVOUS SYSTEM

(PUBLISHED MONTHLY)

A PRACTICAL JOURNAL ON PSYCHIATRY AND NEUROLOGY

Sub-shock Insulin Therapy in Anxiety States and Anxiety Depressions*

LESLIE B. HOHMAN, M.D.**
LT. COMMANDER CARL L. KLINE (MC) USN

In a series of thirty-seven patients, male Naval personnel, suffering with anxiety states with depression and hypochondriacal manifestations, insulin has been administered daily as a therapeutic agent in doses sufficient to induce hypoglycemia without producing coma or convulsions. The results of this treatment in this group of patients, most of whom had failed to respond to other psychotherapeutic endeavors, have been very gratifying and, at times, dramatically successful. The rationale, technique, and results of this therapy will be presented in the following paragraphs.

Rationale

Following the introduction of insulin shock therapy by Sakel in 1935, a wave of enthusiasm for this treatment swept the country. Subsequent observations dampened the enthusiasm considerably, but it is still used with a significant degree of success in the major psychoses, particularly in schizophrenia.

Sargant and Craske[1] under the title "Modified Insulin Therapy in War Neuroses," published in 1941, reported the treatment of 82 cases by sub-shock insulin, describing rapid gains in weight and improvement in appetite, a lessening of conditioned fears, a rapid improvement in generalized neurotic anxiety and hysterical and depressive symptoms in a reactive setting. They further noted that treatment is ineffective against strong psychologic resistance to recovery. This conclusion is particularly significant to our minds because of the striking results obtained by one of us while working with sub-shock insulin in so-called combat fatigue cases while the war was still going on. They concluded that its main value will be for speeding up normal processes of recovery in patients to be boarded out of the Army, fit to do civilian work, and before they had returned to readjusted civilian duties.

In Dec. 1943, Rennie of Cornell University Medical College described the "Use of Insulin as Sedation Therapy in the Control of Basic Anxiety in the Psychoses."[2] This technique for using insulin in sub-coma doses in the treatment of various psychopathologic states was described and 28 cases reported. He described the results obtained as "striking," and reported marked clinical improvement in 19 cases, 4 as showing some improvement, and only 5 as having shown no benefit. His cases which showed marked improvement included patients with schizophrenic excitement, panic, catatonic stupors, hebephrenic dilapidation, suicidal depressions, depression with marked aversion, and manic excitement. He expressed the idea that the effect of the insulin hypoglycemia seemed to be sedative with a specific alleviation of anxiety, far superior to that achieved by chemical sedation.

Our knowledge of the physiology of the autonomic nervous system has grown con-

*These cases were observed and treated at the U. S. Naval Hospital, Naval Training Center, Bainbridge, Maryland.

**Visiting Professor of Psychiatry, Duke Medical School, Durham, North Carolina. Formerly Commander (MC) USNR.

siderably in recent years, and this work affords a physiologically determined rationale for insulin hypoglycemia as a therapeutic technique in emotional disturbances. It is established that hypoglycemia invokes a profuse discharge of the sympathetico-adrenal system and a consequent depletion of glycogen stores to restore the blood sugar to normal levels. This discharge is felt to be activated at the hypothalamic level.[3] Signs of parasympathetic excitation are also present, but are ordinarily masked by the predominence of the sympathetico-adrenal system. The observations of many investigators have demonstrated that in schizophrenic patients there is a decreased reactivity of the sympathetico-adrenal system and a relative preponderance of the vago-insulin system. Following insulin treatment of these patients there is an increase in sympathetico-adrenal activity in those benefited by treatment and no change in those not benefited. Another result of insulin treatment is the occurrence of a relative weakening of the vago-insulin system.[4]

Gellhorn, Lemere, Rose and others have produced experimental evidence associating disturbances in cortical function with autonomic imbalances, and they have postulated a hypothalamico-cortical mechanism for these disturbances. Gellhorn points out that such a theory in no way conflicts with the usefulness of psychotherapy because of the fact that the autonomic centers can be influenced by cortical processes, particularly from the frontal lobes. He concluded that the various therapeutic procedures used in the treatment of schizophrenia act primarily on the sympathetic centers and that due to the prolonged after-effect of these procedures on these centers, their excitability is increased and the disturbed autonomic balance is restored; this in turn effects the cortical processes in a manner as yet unknown.

It is possible that the production of hypoglycemia by sub-shock doses of insulin stimulates the sympathetico-adrenal mechanism at the hypothalamic level, restoring the autonomic balance, re-establishing homeostasis and probably acting on the cortex via the hypothalamus. Whatever the physiological mechanism, the result, as seen in many of our patients, has been the alleviation of anxiety and psychosomatic disturbances, the disappearance of hypochondriasis and restoration of affect to normal levels.

Technique

As pointed out by Glueck[5] in discussing his experiences with the hypoglycemic therapy of psychoses, the technique does not lend itself to easy standardization of procedure. He was dealing with insulin shock treatment, but the statement is equally true in the sub-shock therapy.

Before treatment was started a careful physical and neurological examination was done and certain routine laboratory procedures were carried out. A urine analysis, complete blood count, blood Kahn and glucose tolerance test were done in each case and additional procedures, such as x-ray studies, were ordered when indicated.

Treatment was initiated at 8:00 a. m. daily for five days of each week, the patient having been deprived of food for the previous twelve hours. An initial dose of 30 units of regular insulin was administered subcutaneously on the first day and this dose was increased by 10 units daily to a maximum of 60 units. Increase in dosage was governed by the lowering of the daily blood sugar level taken at 9:30 a. m., 1½ hours after insulin injection, and by the presence or absence of untoward reactions to the previous dose. It was the purpose to obtain a blood sugar level below the critical level of 50 mgm per cent, but to avoid disturbing reactions, such as early signs of shock, coma, or convulsions. Treatment was terminated at 11:00 a. m. each day by giving sweetened orange juice by mouth and then serving the noon meal. Sterile 20 cc. syringes, 20 per cent sterile glucose solution, and adrenalin were in readiness for the treatment of untoward reactions. The number of treatments given to any one patient varied considerably and depended entirely on the clinical response. The patient's weight was recorded before treatment and every four days during treatment.

Reactions Observed

The patients undergoing treatment were closely observed throughout the morning and pulse, respirations, and blood pressure were recorded every thirty minutes. There were

surprisingly few untoward reactions. There was no apparent correlation between dosage of insulin (30 to 60 units) or blood sugar levels and untoward reactions. Usually the patient would become drowsy and sleep most of the morning. Profuse perspiration was common and many complained of mild gastrointestinal cramping. There was no particular pattern of blood pressure or pulse alteration during treatment. Three patients became highly elated on several occasions and one required restraint and intravenous glucose. The early signs of impending coma are pallor, excessive sweating, slow or rapid pulse, thickened speech and inability to arouse the patient from sleep. Glucose was given immediately by mouth at this stage to avoid coma and the possibility of convulsions. Four patients of our group went into coma on one or two occasions and this was promptly relieved in each instance by intravenous glucose. In the event that such a reaction occurred the dosage was reduced 10 units on the following day.

Objections due to fear of the treatment were unusual and never persistent. A few patients objected to the treatment because they disliked receiving "injections" or to having blood "taken" each day for the blood sugar determination, but they expressed no fear as a result of watching other patients being treated.

Type of Patient Treated

In general, the patients who have been selected for this therapy have presented anxiety states with depression and usually with hypochondriasis. The duration of symptoms varied from three months to three years. All cases had been resistant to the usual psychotherapeutic procedures but no psychoanalytic sessions were used and no cases had been treated by electric shock. The symptom complexes of the several typical patients will be described below. The cases grouped themselves into two groups: (1) The well known combat fatigue syndrome. (2) Monosymptomatic hypochondriasis with a substate of anxiety and depression. Thirty-four of the thirty-seven cases had been in combat. No correlation has been observed between the duration of symptoms and the response to therapy. The most common presenting psychosomatic symptoms which responded to therapy were: backaches, headaches, cardiac palpitation, stomach pain, precordial pain, anorexia and insomnia. Patients with so-called personality or constitutional psychopathic disorders were not treated except in a few cases in which superimposed anxiety states were present.

General Response to Treatment

Response to treatment varied considerably in individual cases, both as to promptness and degree of response. Certain general patterns of response were, however, noted. Almost all of the patients immediately gained weight and rapidly put on from 6 to 20 pounds during the period of treatment. Paralleling the gain in weight was an increase in appetite which occurred in almost every case. After about the fourth day of treatment, anxiety and depression would begin to subside and from then on would progressively diminish. Along with diminution of anxiety there would be a decrease in irritability and restlessness. Subjective confusion, when present, would usually begin to subside after the first few days of treatment. Psychosomatic symptoms were the last to show improvement. The number of treatments required to restore the patient to health varied, some requiring as few as six treatments and others failed to respond until the second or third week of treatment. The maximum number of treatments given in any one case to date has been 32.

Almost 100 per cent of the patients treated to date have shown some degree of improvement and many of the responses have been dramatic. Long follow-up studies have been impossible, but a few of the patients have been observed for several weeks after completion of treatment and have not regressed. Defining "recovered" as indicating a complete clinical recovery, "markedly improved" as indicating that the patient has only a

	Cases	*Percent*
Recovered	15	40.5
Markedly Improved	15	40.5
Improved	6	16.2
No Change	1	2.8
Worse	0	.0
TOTALS	37	100.0

slight residue of anxiety or an occasional mild return of a somatic symptom, "improved" as indicating subsidence of anxiety or somatic complaints or both but enough residue to cause some degree of incapacity, and "no change" as just that, the following table represents our results in 37 cases:

Case Reports

The following case reports were selected to illustrate the type of patients treated and the type of responses obtained, including recoveries, improved cases and the one failure of the series.

Case One:

This patient was a 26-year old white male who had developed severe anxiety symptoms several months prior to his discharge from the Army. He had been in combat on Guam, Leyte and Okinawa and he had been hospitalized overseas with a diagnosis of psychoneurosis. Following discharge he had extreme difficulty in adjusting and became involved in marital difficulties and excessive drinking. He enlisted in the Navy because of these difficulties and was admitted to the sick list after only seven days Naval Service. On admission he was depressed, very restless, extremely irritable, hostile, resentful, tense and apprehensive. He expressed disgust with the world in general, loss of energy, anorexia, insomnia, crying spells, inability to concentrate, weakness, blank spells and excessive worrying. He also complained of vague stomach pains, frequent headaches, periods of nausea, cardiac palpitation and difficulty in breathing at times.

After two weeks observation his condition remained essentially the same and he was started on insulin therapy. Following two weeks of treatment he had completely recovered from his anxiety symptoms and had no complaints of any kind. He had gained eight pounds.

Case Two:

This patient was a 22-year old white male admitted to the sick list just prior to his separation from the service. He stated that since an attack of rheumatic fever in 1939 he had been subject to rare, fleeting precordial pain of no significance but that two months prior to his admission these pains had become frequent and severe and he had developed a constant precordial aching. He also complained of urinary frequency, ten pounds loss of weight, periods of depression, irritability, sensitivity, fearfulness, retardation and lack of energy. He stated that his appetite was poor, he had lost interest in sex, had difficulty concentrating and was restless and confused at times. He had frequent weak spells accompanied by cardiac palpitation, shortness of breath, precordial pains and a fear of impending death.

He was placed on insulin therapy and immediately began to improve. Following 19 treatments he was no longer tense, anxious, or depressed and the only residue of his illness was an occasional, fleeting precordial pain.

Case Three:

This patient was a 21-year old white male who had participated in seven major engagements in the Pacific, being aboard an aircraft carrier sunk by a Kamikaze plane. He was admitted to the sick list following an episode of marked emotional instability during which he pursued shipmates with an ax and threw rocks through a barracks window. On admission he appeared tense, restless and apprehensive and professed amnesia for the emotional upset. He dated the onset of his complaints to October 1943, two years previous, the occasion of the sinking of his ship. Since that time he noted increasingly severe irritability, restlessness, depression and retardation. He had developed insomnia, sensitivity, loss of energy and poor memory. He complained of constant pain and numbness in his right leg which had resisted diagnostic and therapeutic endeavors.

Following preliminary studies he was placed on insulin therapy and after two weeks of treatment his symptoms and anxiety subsided.

Case Four:

This patient was a 30-year old white male subject to mood swings for several years and who had been drinking and gambling periodically for about two years.

After about eight months Naval Service he suddenly developed a sense of impending disaster and felt that he would surely die soon. He rapidly became extremely restless, depressed and unable to sleep. On admission to the sick list he appeared much older than his 30 years, depressed, tearful, anxious, tense, apprehensive and fearful. He expressed marked feelings of guilt and attempted to rationalize his behavior. He was convinced that something was going to happen to him to end his life.

One month after hospitalization he had shown no improvement in spite of intensive psychotherapy and was placed on insulin therapy. His response to treatment was slow but he gained weight and became much less anxious, depressed and fearful. He began to develop insight into his illness and was able to face his problems without attempting to rationalize them. His fear of impending disaster has largely subsided, but still returns in mild form for brief periods of time.

Case Five:

This patient was a 29-year old white male with eight years Naval Service and 35 months aboard a destroyer tender during the war. His medical history was negative prior to his present illness.

He dated the onset of his illness to July 3, 1945, on which date he felt dizzy following the evening meal and the thought occurred to him that he might jump overboard. He was given mild sedation in sick bay but continued to have attacks of dizziness and became increasingly more tense, restless, apprehensive and depressed. He lost his appetite, became insomnious, developed many vague somatic complaints and worried constantly.

On his admission here on 8 January 1946 he appeared thin, tense, haggard, tremulous, restless, depressed and mildly confused. During the first two months of his hospitalization he grew progressively worse in spite of all therapeutic efforts. He was then placed on insulin therapy. His progress under therapy was slow and marked by remissions and exacerbations of anxiety. However, his gradual improvement was definite and he gained weight, regained his appetite, was again able to sleep and his anxiety diminished considerably. Except for occasional brief periods, his somatic complaints and hypochondriasis disappeared.

Case Six:

This patient was a 27-year old white male with a long history of marked personality difficulties.

When admitted to the sick list he appeared well nourished, well developed, depressed, sullen, antagonistic and irritable. He complained of vague, severe pains in the calves of both legs and frequent severe headaches and dated the onset of these symptoms to February of 1945 at which time he claimed his legs had been "frozen" while standing guard duty aboard ship. He admitted irritability, depression, slowed mentation, difficulty in concentrating, insomnia, and diminished sex drive.

During a period of two weeks of observation he was noted to be extremely hypochondriacal, fixed in his attitudes, antagonistic and at times agitated. All diagnostic studies were negative. He was then placed on insulin therapy and received a total of thirty treatments. During therapy he improved for brief periods but always slipped back to his former complaints and on completion of treatment his condition was essentially unchanged. This is the one case in our series who has failed to improve.

Case Seven:

This patient was a 21-year old colored male who had enlisted in the Navy after his discharge from the Army where he had served for three years and had been in two major campaigns. He appeared markedly slowed in speech and actions, presented a blank facial expression and complained of severe low back pain of two and a half years duration. He stated that, following his discharge from the Army he had been restless, irritable, confused, tremulous and had suffered with insomnia and battle dreams. Because of these factors he had been unable to adjust and had enlisted in the Navy in order to obtain treatment. An orthopedic study of his back revealed no organic cause for his persistent back pain. He was observed and treated psychiatrically for several weeks without improvement. He was then placed on insulin therapy and after two weeks treatment his backache had disappeared and he was alert, cheerful, relaxed, at ease and non-complaining. He stated he felt completely well.

Case Eight:

This patient was a 27-year old white male who was admitted on 6 January 1946 because of his complaint of chest pain of three months duration. Careful diagnostic studies including bronchographic study failed to reveal any organic cause of his complaints and, following consultation, he was admitted to the neuropsychiatric service on 7 February 1946.

He appeared underweight, tense, restless, depressed, confused and tremulous. He complained of excessive worrying, depression, weakness, fatiguability, shortness of breath, pain in his chest, suffocating spells, loss of sex desire and fear of dying. He was extremely preoccupied with his complaints. He was also obsessed with the idea that when he washed his hands, water poured out of the pores. In addition he was afraid to swallow his saliva, feeling that it was germ-laden. While under observation his condition remained unchanged and he was noted to be depressed and, at times, agitated.

Seven weeks after his admission to the sick list he was placed on insulin therapy. His response to this treatment was dramatic. Following 15 treatments he had gained 18 pounds in weight and had become alert, cheerful, happy, and non-complaining. His hypochondriasis and obsessional phenomena had completely disappeared and he no longer had chest pain. He stated that he felt completely well.

Case Nine:

This patient was a 39-year old colored male who appeared underweight, markedly slowed down in speech and activity, depressed, confused and irritable. He admitted confusion, forgetfulness, and loss of energy. He was markedly hypochondriacal, complaining of vague symptoms in nearly every part of his body. These symptoms had been present for about 9 months and he had previously enjoyed good health. Diagnostic studies revealed no cause for his complaints. He was placed on insulin therapy and after 12 treatments had gained eight pounds weight and had become alert, cheerful, enthusiastic and energetic. His somatic complaints had nearly all disappeared.

Case Ten:

This patient was a 24-year old white male who was admitted to the sick list on 19 July 1945 because of persistent right shoulder pain which had not responded to symptomatic treatment. While

on the surgical service extensive diagnostic studies were undertaken and repeated several times without revealing the source of his complaint. A panorama of therapeutic efforts including diathermy, procaine injections, vitamins and a plaster cast failed to alter his symptomatology.

On 10 January 1946, following consultation, he was admitted to the Neuropsychiatric Service. He appeared pale, lethargic, depressed and apathetic. He was preoccupied with his shoulder pain and had adapted a hopeless attitude towards it. While under observation he showed little interest or enthusiasm in his surroundings and was constantly concerned about his shoulder. On 21 February he had shown no response to the usual psychiatric procedures and was placed on insulin therapy. He gained weight, became alert, cheerful, pleasant and interested in his surroundings and was no longer preoccupied with his shoulder. He states that his pain had diminished at least 50 per cent and that he felt able to carry on.

Case Eleven:

This patient was a 22-year old colored male who had been discharged from the Navy on points after active combat. On returning home "I acted so strangely that my mother asked me if I was shell-shocked." He was troubled with severe backaches, irritability, startability, depression, excessive sweating, suffocating spells and catastrophic dreams. He re-enlisted in the Navy to obtain treatment.

On his admission here he appeared markedly depressed, slowed down and irritable. He was obsessed with the idea that he had a rectal abscess and felt that his severe backaches were due to that. On the ward he was seclusive, uncommunicative, sullen, antagonistic and preoccupied with his symptoms. Diagnostic studies revealed no evidence of organic etiology for his complaints. Two weeks after admission to the sick list, about six months after the onset of his symptoms, he was placed on insulin therapy. He received 13 treatments and his response was prompt and dramatic. He became alert, cheerful, friendly, affable and cooperative and evidenced energy, interest and enthusiasm. His symptoms disappeared completely.

Summary

1. Thirty-seven patients with anxiety states, depression, and psychosomatic disturbances have been treated with daily 30 - 60 unit doses of insulin.

2. The rationale and technique of administration of this therapy have been discussed, together with a synopsis of the successful termination or alleviation of their symptoms.

3. Several case histories have been selected from the group to illustrate the type of patients treated and the responses obtained by treatment.

4. This series of cases indicates that this therapy is a valuable, effective, safe method of treatment in a variety of anxiety states, particularly those arising in the military service and in men with combat experiences.

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Prediction of the Immediate Outcome of Shock Therapy in Dementia Praecox

LEWIS DANZIGER* and JOSEF A. KINDWALL
Milwaukee Sanitarium, Wauwatosa, Wisconsin

In another communication (Danziger, 1946[1]), it was shown from U. S. Bureau of Census data, that the probability of recovery in dementia praecox treated symptomatically in state hospitals is of the order of 0.05 on admission and considerably less later in the course of hospitalization. This probability, determined from the outcome of some 18,000 cases, may now be compared with the chance of recovery on insulin and electric shock therapy given in a public institution, the Milwaukee County Hospital for Mental Diseases.

This hospital houses about 1000 patients, admits and readmits about 350 patients annually, was staffed during the period of study by 5 to 7 physicians. It is comparable to state hospitals, as far as the treatment of dementia praecox is concerned, except that the population served is almost entirely urban and that a large fraction of the population is of eastern European descent or nativity.

Previously reported results of shock therapy are not suitable for present purposes because they are nearly all confined to over-all results. That is, they show the number of patients treated, the number recovered, and perhaps the *mean* duration of illness and the *mean* number of treatments given. No report has been found in which the variables, prognosis, duration of illness and extent of treatment, are simultaneously controlled. This will be attempted in the present investigation and the results compared with the expectation of recovery under similar conditions of hospitalization without shock treatment. It will be shown that the probability of recovery under shock therapy (when consideration is given the duration of illness and the extent of treatment) is far larger than would be supposed from over-all results. In a later study, the results obtained will be shown to agree with equations derived from theoretical considerations.

*Clinical Instructor in Psychiatry, Marquette University.

Materials and Definitions

An analysis is made of the results in 145 courses of insulin shock therapy and 322 courses of electric shock therapy. For simplicity in calculation, the course of treatment rather than the patient is used as the statistical unit of study. In general, the shock therapy patients received no attention (except during the actual treatment) not given to other patients on the same wards and not ordinarily given in public institutions. Psychotherapy was of the most casual and superficial type, as might be expected from the small number of psychiatrists on the staff. Hydrotherapy, occupational therapy, chemical sedation and industrial therapy were given when available and indicated.

Duration: The duration of illness before treatment was estimated from the history. No special effort to obtain accurate histories was made, partly because the hospital facilities did not permit a special effort and partly because it was desired to use only methods available to all public hospitals of this type. The duration is defined not as the "real" duration, whatever that may mean, but as the duration reported by the relative or other informant at the time of admission. That this is a crude method of determining duration is obvious, but it turns out that the reported duration has an important bearing on the prognosis.

The course of treatment was considered as beginning on the first treatment day, not necessarily the day of the first insulin coma or electrically induced grand mal seizure. The duration of illness before treatment is, then, the interval between the first symptom noted and the beginning of shock treatment.

Treatments: In the insulin group, the number of treatments is defined as the number of days on which a coma was experienced; and, by definition, only one coma occurred per insulin day. That is, afternoon (secondary) comas were not counted as extra treat-

ments. Each patient included in the series had at least one coma. The depth and duration of the comas were not considered; some were, no doubt, short and shallow. Spontaneous convulsions were not counted as extra treatments. No patient in the series had insulin and convulsive therapy simultaneously.

The number of electric shock treatments is defined as the number of times a current was passed through the patient. Some of the treatments resulted only in petit mal seizures.

Insulin treatments were given routinely 5 times per week and electric shock treatments twice per week. Some interruptions of this rhythm occurred but were disregarded in this study. Ordinarily, it was impossible to increase the frequency of treatments because of administrative difficulties. Not more than 13 days elapsed between insulin or electric treatments in any one course.

Recovery: Recovery is defined without regard to the presence of insight, and means that the patient became free of symptoms and returned to his former place in society. Lesser degrees of improvement are classified as failures. All patients who recovered continued to be well at least until they left the hospital. Their later course will be considered in another paper.

Diagnosis: The diagnosis was determined by the members of the hospital staff in conference. If a patient was admitted more than once, the diagnosis prevailing at the time of treatment was taken as the official diagnosis. The number of patients in the series is too small to justify consideration of the results in various types of dementia praecox.

Crude Results

Some 45 per cent of the courses of insulin treatment and 34 per cent of the courses of electric shock treatment ended in the recovery of the patient. These are the over-all results, without regard to the duration of illness or amount of treatment. They may be compared with the expectation of improvement under symptomatic treatment administered for a similar period, as follows:

The mean duration of electric shock treatment was 9 weeks and of insulin treatment 7 weeks. Allowing about four weeks additional for observation after the termination of therapy, it is apparent that recovery occurred, on the average, in 3 months in the electric shock group and in a slightly shorter period in the insulin group. Now from the table of prognosis for control patients (Danziger, 1946), it is seen that the incidence of recovery under treatment without shock therapy in the most favorable three months is 1.5 per 100 admissions; and the incidence of any improvement in the same period is 8.8 per 100 admissions. The figures for the control patients represent all degrees of improvement, while in the shock therapy group only the recovered are counted. Allowing for all possible differences in criteria of improvement, the difference between the control and the shock groups is remarkable. The odds against such a difference being due to chance are, by the Pearson chi square test, more than a billion to one.

Since the crude results are comparable to those often reported from other institutions, it is possible that the more detailed analysis of the figures presented in the next section would apply to the observations of other investigators in this field.

Specific Results

We turn now to a more detailed study of the results. Consider first the patients given electric shock therapy within six months of the onset of the illness. There were 99 courses of treatment given to such patients, the number of treatments per course varying from 5 to 46, and the number of courses ending in the recovery of the patient being 64 (about 64 per cent). Note, however, that not all the unsuccessful courses included 46 treatments.

How many of these unsuccessful courses were ended too early, and, in general, how many treatments should be given before the clinician is justified in despairing of the patient's recovery? There is no *a priori* answer to these questions, no *a priori* reason to designate any particular number in preference to another as constituting the minimum standard of adequate therapy. The solution may be approached by a study of the outcome of the 99 courses of treatment shown in Table 1.

From the table it is seen (as is to be expected in the usual biological assay situation) that a small number of patients recovers on a small number of treatments, a large number

TABLE 1

Immediate Outcome of 99 Courses of Electric Shock Therapy in Dementia Praecox of Less than Six Months' Duration

Number of treatments in course	Mean number of treatments in course	Number of successful courses	Total number of successful courses
5	5	1	1
6 to 10	9	10	11
11 to 15	13	21	32
16 to 20	18	17	49
21 to 25	23	6	55
26 to 30	28	5	60
31 to 35	34	2	62
36 to 40	38	1	63
41 to 45	44	1	64
46 to 50	46	0	64

requires an intermediate number of treatments, and a few require a large number of treatments. The number of treatments required to bring about recovery is higher for some patients than for others. It seems to us that some of the unsuccessful courses were terminated much too early. We do not know from the available data why these courses were not prolonged. Perhaps the clinician became discouraged because there was no apparent early improvement; his judgment must count for something, and without doubt some of the courses were interrupted early because the clinician had reason to believe that further treatment would accomplish nothing. But it seems reasonable to assume that if some of the courses had been prolonged, they might have become successful. It is important to note that although one half the recoveries had occurred by the time of the 15th treatment, one patient recovered only after as many as 45 treatments.

Just one half of those who recovered did so on about 13 or fewer treatments. About twice this number of treatments, or say 25, seems to us a reasonable number to specify as the minimum standard of adequacy, as the earliest point at which the clinician may allow himself to despair of recovery on electric shock therapy. Clinical judgment, naturally, must play its role, and the clinician will know when to prolong the number of treatments beyond 25 or even beyond 50. If economic or other factors curtail the number of treatments, it is necessary to recognize that some patients who might have recovered will be denied that opportunity.

Patients who received fewer than 25 treatments and who failed to recover on such a short course are therefore considered by us to have been inadequately treated. They were excluded from later calculations, because the results of inadequate treatment should not influence judgment of the value of any therapeutic procedure. While the number 25 is not without its arbitrary features, it is believed to be of the correct order of magnitude and to be of reasonable size. The number 50 would lead to an obvious statistical artefact, since it would imply that only those who recovered were adequately treated and that the percentage of success of adequate treatment would necessarily be 100. The number 5 is clearly too small, since only 1 course in 99 was successfully terminated before the 6th treatment. Similar analysis of the results in other groups of patients in this series confirms the notion that 25 is a reasonable value for the minimum standard of adequacy for electric shock treatments and that 50 is the smallest adequate number of insulin comas.

Excluding from consideration those patients who had inadequate treatment, we have Tables 2 and 3, which show how the results of adequate treatment depend on the duration of the illness. The results are shown graphically in Figures 1 and 2. Empirical equations to describe the curves and summarize the data could be calculated, but they would be of little interest. They would say nothing that the tables and charts do not already tell us, namely that there is an apparent relation between prognosis, duration of illness and extent of treatment. In a later study, a rational equation relating these three variables will be derived from reasonable assumptions, and it will be shown that the experimental data of Tables 2 and 3 are in agreement with this equation. For the moment it will suffice to call attention to the contrast between the crude and the specific results, and to notice especially what can be accomplished by adequate shock therapy even in the most chronically ill patients. The prognosis in individual cases may be estimated from the tables and graphs.

TABLE 2

*Outcome of Adequate Electric Shock Therapy in Dementia Praecox**

Duration of illness before treatment, months	Mean duration of illness before treatment, months	Courses of treatment	Recovery after N treatments or less																	
			N=5		N=10		N=15		N=20		N=25		N=30		N=35		N=40		N=45		N=50	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Less than 6	3.0	79	1	1	11	13	32	41	49	62	55	70	60	76	62	79	63	80	64	81	64	81
6 to 11.9	7.6	26	1	4	3	11	7	27	13	50	14	54	17	61	18	70	18	70	18	70	19	73
12 to 23.9	15.0	23	0	0	2	9	7	30	10	43	11	48	12	52	12	52	12	52	13	57	13	57
24 to 59.9	36.0	39	0	0	2	5	3	8	5	13	9	23	10	26	11	28	11	28	11	28	11	28
60 or more	105.0	39	0	0	0	0	3	8	3	8	6	15	6	15	6	15	6	15	6	15	6	15

*Percentages are rounded to the nearest whole number.

TABLE 3

*Outcome of Adequate Insulin Shock Therapy in Dementia Praecox**

Duration of illness before treatment, months	Mean duration of illness before treatment, months	Courses of treatment	Recovery after N treatments or less															
			N=10		N=15		N=20		N=25		N=30		N=40		N=50		N=60		N=70	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Less than 6	3.0	37	4	11	7	19	14	38	17	46	21	57	26	70	33	89	34	92	36	97
6 to 11.9	8.0	17	0	0	2	12	3	18	6	35	7	41	10	59	12	71	12	71	12	71
12 to 23.9	16.7	12	0	0	0	0	1	8	2	17	2	17	5	42	7	58	9	75	10	83
24 to 59.9	37.0	10	0	0	0	0	0	0	0	0	1	10	3	30	4	40	4	40	4	40
60 or more	96.0	9	0	0	1	11	1	11	0	11	1	11	2	22	3	33	3	33	3	33

*Percentages are rounded to the nearest whole number.

Summary

A method of processing statistical data on shock therapy is described and is applied to the crude results obtained in 145 courses of insulin treatments and 322 courses of electric shock treatments in dementia praecox. This application leads to a tentative definition of what constitutes the minimum standard of adequate shock therapy. It is shown that for patients in a public hospital:

1. The probability of immediate recovery is increased many fold by shock therapy.

2. The prognosis depends on the duration of illness and extent of treatment in a simple manner which will be treated mathematically in a later communication.

3. Even chronically ill patients may be expected to derive more benefit from adequate shock therapy than from symptomatic therapy.

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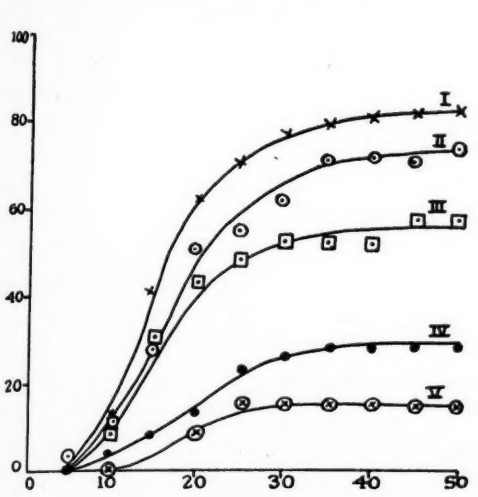

FIGURE 1

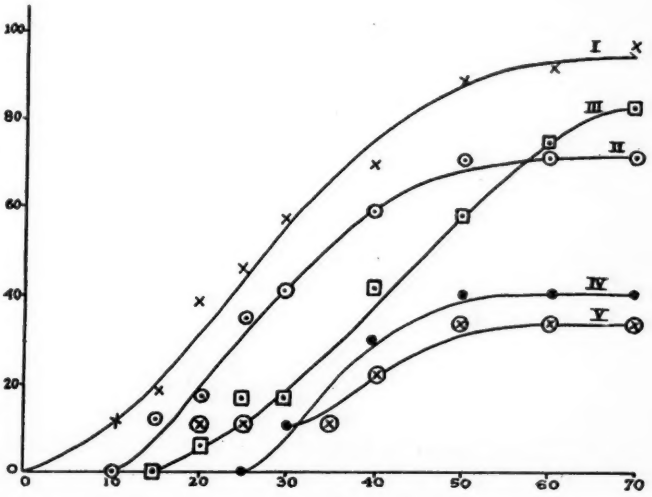

FIGURE 2

Figure 1: Outcome of adequate electric shock therapy in dementia praecox. Ordinate, percentage of courses of treatment ending in recovery of patient. Abscissa, number of treatments. Mean duration of illness before treatment, by groups: I, 3.0 months; II, 7.6 months; III, 15.0 months; IV, 36.0 months; V, 105.5 months. Data from Table 2. Overlapping of the curves is attributed to the small number of observations.

Figure 2: Outcome of adequate insulin shock therapy in dementia praecox. Ordinate, percentage of courses of treatment ending in recovery of patient. Abscissa, number of insulin comas. Mean duration of illness before first treatment, by groups: I, 3.0 months; II, 8.0 months; III, 16.7 months; IV, 37.0 months; V, 96 months. Data from Table 3. Overlapping of the curves is attributed to the small number of observations.

The Role of Psychiatry in Industry*

LYDIA G. GIBERSON, M.D.**
New York, New York

If this bitter war could be said to have any silver lining, I think it might be found in advances in industrial medicine. It is of vital importance that this dearly bought advantage be turned to good account in days of peace.

Industrial psychiatry is really a phase of preventive medicine. It aims to forestall and prevent serious mental and emotional maladjustments among industrial employees. It is not an exact science and can never be an exact science. I prefer to consider it *an emotional first aid station*. It is an attempt to bring the benefits of modern psychiatry and modern neurology to the large mass of working Americans now excluded from these benefits. It justifies its bid for a place in American industry not only by the humane factors involved but also by cold, hard gain in efficiency, morale and profits. Of the results achieved, outstanding is the fact that an adjusted, contented and happy employee pays dividends to a corporation and to a community.

Within the past few years, a new perspective has evolved in the field of psychiatry. That branch of preventive medicine which once was merely custodial in its function, has passed through a difficult and attenuated therapeutic stage, and is now groping its way in the preventive stage. The beginning of psychiatry as a separate medical field is within the professional memory of many of us. We recall that the earlier days exhibited, quite naturally, the crudities and mistakes of every beginning movement. There were the usual enthusiastic excesses over minor advancements; the premature conclusions unhitched to established technics; the posturing of career men; and the factional quarrels of rival theorists. Yet, underneath all this froth, there was a steady movement toward clarification and unity.

Looking back it will be remembered that prior to the entry of the United States into the World War I, psychiatry was almost entirely custodial. Segregation at private and public expense was the accepted answer to most cases of mental ill-health. The medical men who cared for the inmates in those institutions found themselves in a peculiarly cramped professional area. Despite the ambitions and efforts of many able men, the possibilities of experimentation were limited to the known insane in publicly shunned institutions, and among these the pressure of a social attitude and the separation from environmental factors put almost insuperable difficulties in the way of effecting a cure. The earlier theorists could only deduce backwards; their cases had often reached a final stage before they even saw them. It was a tantalizing situation leading at times to generalizations not adequately backed by complete case histories. For a time the whole avenue of speculation seemed to be blocked.

Paradoxically, it was World War I, with all its horror, that gave industrial or mass psychiatry its first big impetus by the simple expedient of congregating under one aegis hundreds of thousands of individuals, wrested from private life and tossed indiscriminately into a military organization. In the main this presented a problem reasonably comparable to that of a large industrial organization. The problem as represented in an army was more striking because it was definitely shown that, despite arbitrary and autocratic military discipline, the man remained an individual to be adjusted and integrated.

Valuable research data along these lines was contributed by the late Dr. Thomas Salmon, the late Dr. C. Macfie Campbell and other prominent psychiatrists. This data was invaluable in pointing the way to constructive work in large civil groups. They found, for instance, that to place a rifle in a man's hand and dress him in khaki did not necessarily produce a fighter; on the contrary, for many it simply induced terror. However, as far as possible, under the stress of war conditions, these individuals were singled out

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**Metropolitan Life Insurance, New York, N. Y.

and put to useful auxiliary work in which they acquitted themselves quite satisfactorily. For the first time the scientific explorer could see the inception, the progress and the closing phases of a mental ailment, and for the first time he had the authority and the numerical scope with which to control his data and reach reasonably accurate conclusions. The whole range of mental ills and mental types was reflected on an identical environment and tested by the same brutally primitive fear of death. Through the sympathetic influence of Surgeon General Ireland, divisional psychiatric officers were appointed and the task of controlling, gauging and adjusting the indiscriminate mass of men was begun. After July 1st, 1918, the psychiatric officers were given the power to reject for overseas service those whom they judged unstable and emotionally unfitted for active service in France and thus standards of procedure were set up and given a practical test. This authority and opportunity led naturally to a close examination of mental data. Many of the taboos surrounding the mentally unfit were shattered, and, as a by-product of a social upheaval, psychiatry became therapeutic and not merely custodial. The way was open to treatment and experimentation.

In the post-World War I period, however, psychiatry became, by a series of literary accidents, a most unfortunately popular subject. Under the popular acceptance of Freud, Adler and Jung, mental ills became matters of common conversation. A garbled nomenclature of "complex-this" and "neurosis-that" hissed about the land. The verb "to psychoanalyze" came to mean, in the average mind, something between use of the confessional and a game of hide-and-seek. Dream symbolism, psychoses, incipient paranoia, inhibitions, phobias, and tropisms were bandied about learnedly to prove one's social position and general awareness. And in all this vaudeville it was difficult for the genuine psychiatrist, who had to prove his facts and define his language. In all honesty, psychiatry, in this middle period, came closer to being scuttled by popular enthusiasm than it ever had been in the earlier period by lack of opportunity to experiment.

When the twenties indulged an unprecedented taste for abnormal psychology, the quacks and opportunists found rich pickings. Distortions of the aims and procedures of legitimate technic were seized upon by the unscrupulous and a new gullibility was exploited. Popular opinion reversed its field. Laymen soon became vocal in their criticisms and, as usual, the criticisms were levelled indiscriminately at guilty and innocent alike. However, this journalistic phase gradually settled to the respectable but seriously restricted area of the psychiatrist's office. There, patients came for professional treatment, but the length, the cost, and the inconvenience of the treatments limited economically the class of persons who could benefit. Psychiatry, in fact, became something of an upper-class fad, and the type of cases treated, led for a time, to an overemphasis upon the mental ills of a numerically minor social group.

Behind this surface of fashion, easy popularity, and war opportunity, there was working very quietly an even more promising force for psychiatry, a movement which combined the advantages of general support and mass data without bringing the detractions of loose thinking and bureaucratic control. As early as 1916, psychiatrists became aware of the tremendous possibilities inherent in the masses of industrial workers. There one might observe all types and all degrees of mental sickness, and there was a field in which the conclusions one reached might be put to work to prevent sickness.

The earliest industrial application was at the Cheney Silk Company in 1916, research being conducted on the high costs of maladjustments in the employee's emotional attitudes. In 1917 and 1918, the late Dr. Elmer E. Southard interested the Engineering Foundation in the possibilities of a psychiatric approach to industrial personnel problems. In the course of a survey made in 1920, he found that 62 per cent of more than four thousand cases observed, reached the discharge status through traits of social incompetence rather than occupational incompetence. In the early twenties, Dr. C. Macfie Campbell and Dr. Henry B. Elkind, did significant work in the Boston factory area. In 1922 the Metropolitan Life Insurance Company started a full psychiatric service for employees, a service which continues to the

present day, when interviews total more than five thousand a year. Later, in 1924, Macy's Department Store in New York City, employing about nine thousand persons, began a psychiatric investigation which today serves as a research department.

After 1924 there were only sporadic attempts at industrial application, and these for the most part were inadequately conceived and executed. The next major impetus came from industrial personnel groups in 1932 when they began to apply psychologic concepts to their perennial problems of labor turn-over and labor placement. Safety workers and other industrial control groups have altered their procedures to allow for psychiatric technics. The progress from 1934 to 1941 was a slow one of group education, of preparing for the full development of industrial possibilities. Thus psychiatry moved slowly away from the fashionable patient who alone could afford a two year treatment for real or fancied mental ailments. Slowly the mist created by novelty and jargon lifted. The medical facts emerged. World War II has permitted psychiatry to come out of its hiding place in the consultant's office into the light of public scrutiny. It is no longer something to be bought at a high price or something the State exercises in the control of mental cases. It is finally reaching that healthy status where it is no more mysterious or awful than the setting of a broken finger.

Most physicians in the Armed Services have had opportunity to observe the functioning of psychiatry as a mass effort. Its functions are quite similar in industry although they have not gone nearly as far. At the present time, industrial psychiatry's functions are segregation and prevention. Therapy is only advised. This last is carried out by private psychiatrists or by institutions, public or private. Industrial psychiatry, as we stated, must be an emotional first aid station. As such its functions are those of an industrial physician with special neurological and psychological training—a strong sprinkling of common sense—a practical approach to every problem, and, above all, a very definite understanding of management.

As an integral part of a medical set-up, industrial psychiatry demands first, full medical understanding plus a "zone of neutrality" in which the employees normal woes may be sorted out from real afflictions, mental or physical. It is amazing how much sand imaginary woes can throw into the wheels of industry. Functional stomach symptoms can cause just as much organizational damage as early carcinoma.

One cardinal principle of industrial psychiatry follows American law. The employee entering the door of your office is considered perfectly normal until conclusively proved otherwise. The psychiatrist, per se, (working on the premise you must be ill if you are seeing him), will probably have no place in industry. Psychiatry in its preventive phases does and will have such a place.

How is the application of psychiatric principles to be carried out in industry? I believe that the industrial physician is the logical medium to administer a psychiatric program for the simple reason that industrial psychiatry is at best a supplemental service to general industrial health. The industrial physician has the basic medical training implicit in the actual meaning of psychiatry as a practice. Through long years of faithful ministering to the physical ills of the worker and advice concerning his outside medical service, this physician has built up a backlog of confidence. Again, the industrial physician enjoys in the main, the complete confidence of management, his employer, for whom he is doing a day to day specific job. Thus, he is in a position, with the exercise of ordinary tact, to place the psychiatric aspect of the job on a plane of reasonable neutrality.

It is entirely rational to suppose, for instance, that the worker who has come for emergency treatment after repeated minor accidents will respond to the doctor who has treated him and is seeking the psychiatric basis for this accident record. It is in this type of rapport that any application of mass psychiatry must find its foothold, for, in the final analysis, all psychiatry is founded on confidence in the practitioner.

Most American workers have made their adjustments to industrial living, and if their existence is not upset too radically, they will continue to function smoothly and consistently with only normal lapses for illness and age crises. In any large organization, however, there will be at any one time a fairly

constant 20 to 25 per cent of the workers who for chronic or temporary causes are unable to bear efficiently the stresses of industrial work. Peacetime experience has shown that the psychiatric bulk in industry subdivides into four basic types you are apt to meet constantly in the general practice of industrial medicine.

I would like to refer to material contained in another paper, "The Technique of Listening to the Worried Employee," published in Industrial Medicine, September, 1940. For the sake of simplification, I have limited the neurological and psychiatric distinctions to four basic types met constantly in general practice of industrial medicine. In two clear-cut types the crux is early detection and I have been content to adduce symptoms only. The other two, I have discussed at some length. With attention to these four categories a rough classification is possible, and an immediate program made feasible.

The first group comprises those suffering from organic neurological conditions such as brain tumor, epilepsy, syphilis, cerebral accidents. When employees complain of headaches of varying degrees, of dizziness, of general irritability, of tremors, of rigidity of muscle, of attacks of unconsciousness, of involvement of the cranial nerves—the doctor will naturally think of diseases of the central nervous system. A careful history and examination will probably determine whether he is dealing with trauma, infection or new growth. Employees so afflicted are too ill to work, and the industrial doctor's part of the program is to try to detect the early symptoms and have medical care begin under the family physician or chosen specialist. Early detection may save much in efficiency and safety. The fixed pupil of the oncoming tabetic, the lessening grip of the right hand in slow leaks of brain arteries, the dizzy spells of the incipient epileptic—these are some of the warning signals of oncoming accidents and disruptions of the plant economy. The symptoms are such unassuming ailments that the busy doctor is apt to overlook them unless he makes a point of listening carefully to the patient's recital of his case.

The second group includes those employees suffering from frank psychoses, commonly called mental breakdown. Some of these cases "break" on the job, although the patient probably had been showing unheeded danger signals for a long time. A frank psychotic break means emergency treatment to prevent the employee from attacks upon himself or his fellow workers. Protection can be given, usually, only in a hospital. As industrial physicians, our responsibilities are threefold in these cases: first, to detect symptoms such as panic, extreme suspicion and hallucinations (usually auditory), and to refer such patients to specialists of human behavior. Second, if these cases should become emergencies on the job, to cooperate to the fullest extent with the family physician in the disposal of the case, and to strive to help management to understand that unusual behavior should be referred early to the medical department. Third, after the psychotic episode is past and the employee has recovered, to help as much as possible to re-establish him at work. Such employees do recover, and once returned to normal they are as able to carry on their duties as any employee who has been absent for a purely physical disorder. Where is the basic difference between the employee out for one year with a psychotic episode and the employee out two years with tuberculosis or six months with a fractured femur? Complete recovery from psychosis is more the rule than a continued illness, and some of the grossest injustices in industry have happened because that simple fact has not been emphasized with the management. In these cases the decision of a competent specialist should allay all suspicion toward the recovered employee.

The third group, the psychoneuroses (commonly called nervous break-down) and the fourth group, maladjustments, furnish most of the employee problems. The absenteeism and lessened efficiency which result in lowered plant production can be traced directly to these groups. Let me quote estimates on the size of these groups. Dr. Louis Hamman, Associate Professor of Medicine at Johns Hopkins University, states that "at least one quarter of all the problems with which the physician deals are essentially psychiatric problems." Dr. Maurice Cassidy, British consulting cardiologist, asserts that 29.5 per cent of cases referred to him are psychoneurotic

in origin; the symptoms are cardiac but the causative factors lie in the realm of psychosomatic medicine. In an article entitled "The Relationship of Psychiatry to Internal Medicine" which appeared in the Bulletin of the Johns Hopkins Hospital for September, 1939, the statement is made that 40 per cent of the internist's practice is made up of psychoneurotic patients.

Obviously the diagnosis "nervous breakdown," "nervous exhaustion," "debility," "gastritis," "insomnia," or other vague terms refer to psychoneurotic and maladjusted conditions. Psychoneurotics are emotionally immature individuals. In all these cases there is a definite fixation of the attention upon the patient himself and an emotional reaction far out of proportion to his difficulties. Too often his symptoms are a direct play for sympathy and attention, or an excellent alibi for failure in a given situation. These patients translate their disappointments and difficulties into physical symptoms much in the same manner that a young boy develops stomach ache on the morning that he has a difficult test at school. The grown-up is more adroit and sometimes his pseudo symptoms will triumph over even a laboratory checking. When the psychoneurotic or maladjusted employee is not obviously ill enough to the untrained eye to be away from work, is just the time when he is most costly to an organization. Not only does he lose time but his lowered efficiency and emotional distortion affect sympathetically all those around him and the morale and working efficiency of a whole group may be seriously impaired by his presence. The nuisance element increases in direct ration to this person's pyramiding mental symptoms.

The psychoneurotic, who is really a sick person, shows many symptoms that are wilfully detrimental to business efficiency. The attitude of inferiority, the chronic fault-finder, the over-dependent employee, the day-dreamer, the worrier, the chronically nervous, the excessively fatigued,—all belong in the medical group roughly termed hysterical, and they account for the largest percentage of total time lost from work because of illness. The attitude of inferiority manifests itself in resenting all criticism, even though it be constructive, and the compensatory mechanism due to inferiority often shows itself in bullying by the one in authority, and in undue insistence on minute detail. The chronic fault-finder with his tendency to blame others is probably another individual suffering from an inferiority complex. The day-dreamer escapes our prosaic world and its difficulties; the body he leaves behind is slow, inefficient and accident-prone. One of the biggest problems in business and industry today is the over-dependent employee — the one whose feelings are always being hurt, who is upset over every change and every move because he expects the same protection and loving kindness he receives in his own home. To him and to all the others, the psychiatrist, if given a chance, can bring definite improvement, if not a cure. Under the present system the industrial doctor is the only adequately trained man on the spot where these cases appear; if he will aid in the detection and disposition of them, the gain is apparent.

How then can the industrial doctor meet and handle the first medical phases of these cases? The severe psychoneurotics have deep-seated fears, obsessions and hysterical manifestations and need extended treatment by a specialist. Immediately upon detection, these workers should be routed to a psychiatric center and the discussion of parallel or accompanying physical conditions be kept to a minimum. Many a psychoneurotic has been done irreparable harm because the physician after completing an examination has blurted out, "you have a dropped stomach," instead of analyzing the emotional stability of the patient and keeping quiet. A receptive manner coupled with vague reassurances and the assertion that responsibility for decision rests with the doctor are the proper steps.

Many of the psychoneurotic and maladjusted can be dealt with successfully by the industrial physician himself. By patience and a liberal sprinkling of medical common sense, he can use his knowledge of human nature and his knowledge of the patient's home and working environment to good effect. The procedure is simple and practical. The patient will rarely know what is wrong with him but the doctor, by listening and analyzing from behind a sympathetic front can abstract the full details of the patient's condition. The nature and intensity of the patient's

explanation will provide the doctor with just those hints which he needs for a sub-surface analysis. Of this secondary explanation the patient ought to be kept in ignorance, of course, until such time as revelation will have a decided therapeutic effect. In these discussions the employee must be made to feel that he is in a neutral, friendly atmosphere, that the interview is strictly confidential and anything he has to say will assuredly not be used against him. The patient must be encouraged to talk freely and frankly. The doctor must be a good listener with considerable patience and it will help tremendously if he has a sincere interest in human beings and their innumerable difficulties.

In the simpler cases a frank discussion is usually sufficient to give the intelligent patient a true perspective on his problem and he will be able thereafter to handle it himself. The doctor's contribution here has been a sympathetic attitude, intelligent listening, and, of course, extremely valuable time. In the more complicated situations, the employee and the physician can discuss ways and means of meeting the responsibilities which the patient cannot escape. Here the note of equality must be upheld and a concrete plan of action formulated. After that the doctor stands by as an advisor willing to lend active assistance only when it is absolutely necessary.

Occasionally in an industrial organization, emotional upsets appear in greater numbers from one specific department. If the doctor will suggest an investigation by the personnel department, he may be able to exchange a dozen cases for one—a maladjusted foreman or section head who has been upsetting his subordinates. And it is important to remember that executives and supervisors are human beings and subject to rules of human adjustment. If they are unstable and maladjusted, the results may be devastating to the hundreds under their direction. Detection and disposition of maladjustments in high places may demand more tact but the principles and the methods are the same.

Only time can determine the degree to which industrial psychiatric departments should be developed. But, in the interim period, there is nothing to prevent the application of psychiatric principles by the industrial physician.

In summary I would like to again borrow from the article published in "Industrial Medicine." There are seven fundamentals for the industrial physicians to know. I keep coming back to these again and again as basic material. How can the industrial physician, with his present equipment, aid in the great task of meeting the emotional problems of a plant and maintaining high industrial morale?

1. He can expect and trace the emotional complications which will come with every injury and illness he treats or advises on. Even a rough record of his findings may provide valuable data for generalization.

2. He can listen. The therapeutic value of the interview is considerable, and the connection between surface symptoms of seeming irrelevance such as insomnia, "stomach trouble," vague neuralgias and the like, with serious underlying conditions may be detected in time for remedial action.

3. He can diagnose the industrial trouble spots—foremen, environment, fatigue, group maladjustment—by analyzing and reviewing his cases at regular intervals.

5. He can recognize the obvious maladjusted types, arrive at a rough classification and dispose of them by advising transfer, outside therapeutic treatment or education of the employee in simple principles of mental and physical hygiene.

6. He can help prevent maladjustment by exercising actively his advisory function: a) by repeatedly bringing to the attention of management each proven instance of preventable maladjustment; b) by encouraging foremen, section heads and supervisors to come to him for advice and information on employee problems; c) by doing all he can to bring the extra-industrial factors to bear upon any interpretation of employee difficulties.

7. He can conserve manpower and uphold morale through fighting to secure medical immunity for the emotionally ill.

The Ninety-Sixth General Hospital

(The Story of an Army Neuropsychiatric Hospital)

HENRY J. MYERS, CAPTAIN, M.C., A.U.S.

In February 1944, the 96th General Hospital landed in England and arrived at its hospital site in Malvern Wells. The unit had trained and staged in Paris, Texas, as a regular general hospital and had on its staff at that time a single psychiatrist, Major (later Lt. Col.) Hugh Kiene of Providence, Rhode Island. Upon arrival in England, the commanding officer, Col. E. M. Smith, was informed that the hospital was to function as a neuropsychiatric hospital. There were 200 neuropsychiatric patients already hospitalized at Malvern Wells. Col. Smith and Lt. Col. Kiene were faced with the heroic task of converting a general hospital into a specialized hospital suitable for the treatment of neuropsychiatric patients. Within a relatively short time, Lt. Col. Kiene had trained nurses, wardboys and those of the physicians who were interested in remaining. At the same time, Col. Smith had managed through transfers and requisitions to assemble a competent and qualified staff. When I joined the 96th General Hospital in September 1944, it was a smoothly functioning efficient neuropsychiatric hospital with a bed capacity of 1500 to 2000 patients. It is the purpose of this paper to describe the functioning of that organization.

The 96th General Hospital was, for a long time, the only general hospital in the European Theatre of Operations dealing exclusively with neuropsychiatric patients although there were several neuropsychiatric station hospitals and, of course, almost every general hospital had its neuropsychiatric section. The mission of these hospitals was to provide definitive treatment and to return as many men as possible to duty. The 96th General was the place to which psychotic and locked ward patients were sent as well as the therapeutic failures of the other hospitals; men who had been tried on limited duty or at special schools but had failed to make the grade. Many of the patients arriving at the 96th were already boarded to the Zone of the Interior and sent to us while awaiting transfer to the States. A few patients arrived more or less directly from combat. Most of them came via five or six previous hospitals. A rehabilitation section was maintained but by far the vast majority of men were returned to the States. Under these conditions, it would have been easy to adopt an attitude of therapeutic nihilism and to provide custodial care only. However, quite the opposite was the fact and a very active therapeutic program prevailed.

Originally the hospital was divided into admission, treatment, and disposition sections. The patient's history and physical examination was accomplished on the admission wards. His disposition was decided on. If he needed treatment he was transferred to a treatment ward, if not, to a disposition ward. Sometimes he might be sent to the rehabilitation section if it was thought possible to return him to duty. Later it was found much more satisfactory to have the patient under the care of the same doctor from the time he entered the hospital until he left. Thus while treatment wards were continued for the physical methods of treatment, the patient always returned to his original ward at the completion of treatment. Disposition wards were continued for routine cases, those sent primarily for short term boarding, and for the overflow from other wards whenever the pressure of new admissions became too great. The more adequately trained physicians were assigned to the active wards and worked in pairs with both an open ward and a locked ward. Ideally each pair alternated cases on the two wards and made daily rounds on both wards. It was thus possible to transfer a patient from an open ward to a closed ward or vice versa according to the needs of his case and continue him under the care of the same physician.

The treatment section in so far as physical methods of therapy were applied, was under the direction of Major Walter Goldfarb, formerly of Bellevue Hospital in New York. These

physical methods included electroshock and insulin coma treatment. Metrazol was occasionally used, especially in intractable behavior problems. When the ward officer considered this type of therapy indicated, he notified Major Goldfarb who would see the patient with that ward officer, confirm the need for treatment, and decided on the type to be used. In electroshock the patient remained on his original ward, visiting the treatment ward in the morning and returning to his original ward after treatment. The ward officer saw the patient as usual and the need for concommittant psychotherapy was recognized. After 4 to 5 electroshocks the patient was again seen by Major Goldfarb to determine whether to continue or terminate the treatments. The patient was seen again at the conclusion of a series of electroshocks and graded as recovered, partially recovered or unimproved.

The insulin coma treatment was carried out on special wards and consisted of a series of twenty comas. The special feature of this treatment was that the insulin was administered intravenously, allowing a more rapid determination of the coma producing dose. The coma was also terminated at the end of an hour by glucose intravenously. Electroshock was used mainly for manic-depressive, severe reactive depressions, and those schizophrenic psychoses with prominent affective features. Insulin coma was used chiefly in schizophrenic psychoses without affective features. Occasionally a patient who failed to respond to one type of treatment did well with the other. Another form of physical therapy carried out on the ward according to the judgment of the ward officer, was modified insulin treatment or sub coma doses of insulin. This was most helpful in cases where there had been loss of weight and physical deterioration.

The remainder of the treatment program and the entire training program was under the supervision of Major William Needles, formerly of Mt. Sinai Hospital, New York. Major Needles interviewed patients whom the ward officer recommended for individual or group psychotherapy. This therapy was carried out by the ward officer with considerable latitude depending upon his interests and training. Special problems were referred to Major Needles' ward for more intensive study. Major Needles lectured to the nurses and later, in response to a demand from the younger men, held clinical conferences two or three times a week. These conferences started as case presentations and through discussion led to a series of lectures on psychoanalysis by Major Needles. This was later followed by several lectures on brain physiology by Major Goldfarb.

As mentioned, individual ward officers were allowed considerable latitude. Hypnosis and narcoanalysis were utilized as the ward officer deemed advantageous and according to his confidence in his own ability to use them. Major Albert E. Rauh worked on the officers' wards putting much time and enthusiasm into his work. Capt. Jack Hartman worked on the prison wards with interesting clinical material. He performed all his abreactions and hypnoses out on the ward in view of the other patients. He developed a remarkable spirit of camaraderie among the patients. He was able to recover amnestic episodes in the criminal cases with intravenous sodium amytal and also by combining hypnotic techniques with the amytal interview it was possible to use much smaller amounts of the drug. Capt. Harold Rosen used pentothal and hypnosis frequently. He found that almost all the combat cases were readily hypnotizable and that it became less often necessary to use narcoanalysis. (Of course when there was spontaneous ventilation of conflicts, no further uncovering techniques were necessary). Capt. Eugene Winkleman employed group therapy with considerable success. Majors Alexander Ross and James Lasater did all the neurology in the hospital and also took and interpreted the electroencephalograms.

In addition to routine ward duties, many men were assigned special research problems which produced many valuable manuscripts, some still to be published. Kiene, Goldfarb, Laughlin alone, and in collaboration, wrote several papers dealing with the results of physical methods of treatment in combat and non-combat cases. Needles wrote two or three articles, one a comparison of character traits of 100 neuropsychiatric casualties with 100 surgical casualties and another a study of the successful neurotic soldier. Rosen produced a monograph on paranoia (not yet

published); Kiene, Goldfarb, Rosen and Myers discussed "The Psychopathology of Psychotic-Like Reactions in the Combat Soldier"; Rosen and Myers wrote on "Abreaction in the Military Setting"; and Myers and Von Koch dealt with "Reactive Depression, A Study of 100 Consecutive Cases".

No account of the 96th General Hospital would be complete without a brief reference to the work of Corporal Sigfrid Von Koch. Cpl. Von Koch had a Ph.D. degree from the University of Berlin and had been trained in psychoanalysis. He assisted the ward officers in hypnotic therapy and experimented in selected cases with abbreviated psychoanalytical techniques, holding daily sessions for six weeks. He worked with several depressions, with a group of embittered and somewhat paranoid paratroopers and with other special groups. He achieved interesting results and it is to be hoped that his work will be published soon. Among other enlisted men who were helpful, Sgt. Gordon H. Greenwood and Cpl. Clayton R. Brower did the psychometric and Rorschach examinations.

Special mention is also merited for the nurses, wardmen, and Red Cross workers who were in daily contact with the patients and did so much to maintain and increase their morale. Unlike the medical officers there were relatively few transfers of nurses and wardmen. Most of them had to learn how to deal with psychiatric patients without previous training. This they did with considerable tact and insight, aiding immeasurably in the success of the therapeutic program which was aimed at putting every patient somewhere on the road to mental health even though a complete cure might not be possible in the time available. Efforts were made to have every patient understand his illness and feel that something was being done for him. While the program was not ideal, many of us being of the opinion that neurotic patients would have better care in a general hospital rather than in a special psychiatric hospital, the 96th General Hospital performed a difficult and important task and did it quietly and efficiently. The unit was scheduled to go directly to the Pacific but was broken up and disbanded with the sudden victory in the war against Japan.

Appendix

I. *Copy of Letter Given to Each Patient on Admission:*

A great many of you have passed through several hospitals before arriving here, have had to answer the same questions, and go through the same set of examinations repeatedly. This is unavoidable under present conditions even though tiresome and often confusing to the individual concerned. This memorandum is intended to clear up some of the confusion by telling you something about the 96th General Hospital (NP); why you were sent here; what we attempt to do here; what you are expected to do here; where you go from here.

The 96th General Hospital is equipped to take care of those men whose problems could not be dealt with adequately in hospitals further forward in the echelon, because of lack of time or space, or the nature of the problem involved. This hospital has special facilities to take care of the sort of difficulties that you are troubled by.

The medical officers here have had years of experience in this field of medicine, Psychiatry. You will be assigned to the ward of one of them, who will as a rule have you under his care during your entire stay in this hospital. He will go over your story patiently, try to find out how your difficulties arose, and decide what should be done about them.

Psychiatrists know much more about conditions such as yours than they did in the last war. They are able to detect signs that all is not well with a man much sooner than was formerly the case, and to recommend the necessary treatment. For these reasons, the outlook is much more hopeful than it used to be. Because you happen to have heard of a veteran of the last war who was "nervous" and has not recovered is no reason to take a hopeless attitude about yourself.

For certain conditions there are special forms of treatment, of the latest type, fully provided for in this hospital.

Another point to remember is that, as psychiatrists, our aim is to get a man well—as completely as possible and as quickly as possible—whether he is to return to duty in the army or to civilian life. We assume that the man will want to carry on in whatever capacity he is most suited, in order to win the war, and we look upon our job as rendering him as fit as possible for that purpose, wherever he may be placed.

To what extent you improve and how quickly depends not only on the medical officer, no matter how good he may be; it depends at least as much on you, on your willingness to cooperate and to meet him half way, on your attitude. Modern warfare puts strains and hardships on a man such as he has never run up against before. It is no disgrace for a man to become upset or shaken under such circumstances. But you

must bear in mind that this upset is only a temporary affair. There is no reason why you should not, by your efforts and with the help of the medical officer, get over your condition and be your old self again.

You will find while you are here that an effort is made to keep every man as busy as possible. This is done because it is an important part of the treatment. The more a man does, the more quickly he proves to himself that he can accomplish things and the sooner he gets back some of the self confidence he has lost. Being active, no matter how unimportant the job may seem, is better than sitting around on a ward, moping about yourself and letting your muscles get flabby. We aim, therefore, at making the Rehabilitation Section as active as possible by the participation in it of all patients capable of any type of work or exercise.

The Red Cross is set up to assist in the recreation program, to provide certain types of occupational therapy, as well as to follow through in certain personal problems a man may have, such as failure to hear from home in a reasonable time, inability to contact his family, etc. Your ward officer will refer you to the Red Cross when the indication arises.

As a soldier you will be expected to observe the usual rules and regulations. There is a reason for each of them. No large establishment can be run with everyone doing exactly as he pleases.

When you have been in the hospital for a sufficiently long time for the medical officer to study your condition and observe the progress you have made, you will appear before a Medical Disposition Board. This board will discuss the situation with you and determine, on the basis of all the facts, just where you best fit in at the time. You will have the opportunity to assist the board in its decision by telling the members of it just how you feel and whatever else you think has a bearing on the decision to be arrived at.

We think this hospital has a great deal to offer you toward getting well—provided that you feel the fight to regain your health is worth making and you are anxious to cooperate.

II. *Memorandum on Group Therapy*

Advantages of Group Psychotherapy:

1. Large number of patients can be carried when time is not available for individual therapy.

2. Individual patient is confronted with similar symptoms and signs in others and realizes he is not so unique and unusual. He will be encouraged to speak up freely regarding his own difficulties.

Recommendations for conducting group sessions:

1. Medical officer should have seen enough of patient in individual interview to give him a fair grasp of the type of person and the type of problem he is handling.

2. The level of the discussion should be that of the least endowed member of the group. Patients with too little endowment should not be included in the group.

3. Patients should be encouraged to participate as much as possible, especially the passive or reticent ones.

4. Not more than 12 to 15 individuals in a group.

5. "Depth psychology" not feasable.

6. Consult available literature on the subject.

Material for discussion:

This will necessarily remain fluid rather than fixed, depending on what problems come to the surface, the background of the therapist, the make up of the group.

Tentatively offered as a basis for stimulating discussion are:

1. The meaning of "neurosis"—distinction from organic disease—an emotional disturbance, not intellectual—the importance of anxiety—its value in preparing the organism for defense—its persistence in some instances after danger has past (condition reflex mechanism apparent in some cases)—the translation of emotional tension into physical manifestations—hypertension, tachycardia, vomiting, frequent urination, tremor, dizziness, headaches, etc., etc.—elementary description of nervous system to show means of transmission of psychic stimuli to end organs.

2. Factors in production of combat neurosis—difference from disturbances seen in civilian life, where the important elements are more often beneath the surface—in combat conflict more apparent; self-preservative urge vs. sense of duty, responsibility for the group; breaking up of each individual varies, depends on many factors; the stress and strain he has had to stand up against; the past of the individual, which has made him what he is at the time of undergoing the stress and strain; the honorable solution of the conflict through illness.

3. Neurosis is not insanity and will not result in insanity; it is reversible it is not a disgrace; no one who has done his utmost need feel ashamed; if the desire to get well is there, the outlook is good; discussion of fear of getting well, the gain through illness; fear not a sign of cowardice, lack of fear may be due to ignorance, lack of imagination, folly; to carry on despite fear is harder than to carry on without fear.

4. Discussion of various signs and symptoms as they occur: battle dreams, conversion hysterical signs, amnesia.

5. Discussion of various problems of adjustment of the civilian soldier in the army; of the combat soldier to non-combat outfit; of soldier returned to civilian life.

Saint Elizabeths Hospital, Washington, D. C.

Neurological Clinical Pathological Conference

of the

Cincinnati General Hospital

CHARLES D. ARING, M.D., *Editor*

Case No. 45-53

Presentation

The patient was a 23 year old veterinarian, who became ill sometime during mid-summer of 1944. The initial symptom was some difficulty in vision, which the patient termed nystagmus, he had to turn his head to properly focus the eyes. He went to a physician who told him he had labyrinthitis, and gave him tablets containing phenobarbital and hyoscyamus. The patient believed that these tablets caused the eye trouble to remit.

The next symptom, which occurred possibly in October 1944, was an ache in the left shoulder joint and also in the low back. The patient suspected that he might have undulent fever and sent his blood to the Ohio State Laboratory, where the titre was found to be .1:80. A few days or weeks later the left lower extremity was slightly weak. After about an hour of hunting in late November 1944, the "left hip gave out" and became so weak that he could barely walk. The left lower extremity continued to get weaker, and he walked with a limp. Shortly thereafter the left arm began to get weak.

The patient noted emotional instability in early November. He also found on drinking water or soup that it might come out his nose. In November his family physician found that he could not walk a straight line and in mid-December sent him to a hospital in Columbus, Ohio, for study.

The patient was at the same hospital on three occasions, for three days in December 1944, for 21 days in January 1945, and for four days in April 1945. At the first admission a house officer was able to add the following symptoms: swaying gait, hesitancy in speech, repetitive yawning, and headache.

In the examination in December 1944, there was recorded speech hesitancy, horizontal nystagmus, absence of the abdominal reflexes and hyperactivity of the deep reflexes, an extensor plantar response on the left, inability to walk a straight line, and swaying in the Romberg position.

In January 1945 the weakness was progressing. The patient now noted mild atrophy of the musculature of the left arm and shoulder. About January 15 the patient was told that the abdominal reflexes had returned and the grip in his left hand was stronger. He said that his speech defect was worse in the evening. In the January admission to the hospital, the gait was noted to be unsteady and broad-based, and the left arm did not swing when he walked.

During February 1945 the weakness progressed and he began to have double vision, particularly for mo\ ng objects. He had to have help in walking about the house, and by March he could no longer get about even with help. By that time he had lost all use of his left extremities. It was impossible for him to move food about in his mouth or to protrude the tongue. He stated that he could voluntarily open his mouth only a small degree, yet when he yawned the mouth was opened completely, so much so that his lower jaw was partially dislocated. Yawning was frequent, and he himself noted that during yawning he was able to elevate the paralyzed left upper extremity. He had some difficulty in starting urination.

During the stay at the hospital in early April 1945 it was noted that speech was practically unintelligible. He was having great difficulty in swallowing, and he had left hemiplegia. In the physical examination it was recorded that the face was expressionless. They recorded marked nystagmus and thought they saw temporal pallor of the optic discs, which had not been present during the previous admissions. They noted spastic paralysis of the left extremities and bilateral extensor plantar responses. They obtained no abdominal reflexes.

In April 1945 the patient said that parts of his face seemed to be hypersensitive; if

he rubbed his face, or eyes, or nose, or when his lips touched something, he shuddered all over. He also had peculiar sensations when his left limbs were touched. He was able to swallow soft foods. He himself noted that when his chest was washed with warm water, it became very red down to the level of the nipples. In April his right upper extremity began to become weak. He observed muscular twitching all over his body.

The patient was admitted on April 13, 1945, to a private hospital in Cincinnati. There the following signs were noted. The patient had considerable difficulty in focussing his eyes. He could move them partially to the right and not at all to the left beyond the vertical horizontal. There was nystagmus whether he tried to move the eyes laterally or vertically. The speech was unintelligible. He had great difficulty in swallowing. Mucous would gather in the throat and result in coughing and choking, and the fauces had to be repeatedly cleared with an aspirator. There was weakness of all of the extremities; paralysis on the left and considerable weakness of the right lower. The right upper extremity was nearly normal in strength, however, tests demonstrated its incoordination. The resistance to passive movement was extreme in the left extremities and mildly increased in the right lower extremity. The left forearm was held in a flexed hemiplegic attitude, the left lower extremity in extension, the foot rather markedly plantarflexed. No sensory abnormalities were demonstrated. The deep reflexes were hyperactive. There were strong bilateral extensor responses.

The course was one of gradually increasing weakness until death. He had considerable difficulty in passing urine and in late April this function became involuntary. After April 27 a Levine tube was necessary for feeding. He perspired freely and had occasional bouts of nausea and vomiting. He became cyanotic on May 11 and died on May 12.

Laboratory Data: During the final hospital stay the rectal temperature remained around 99° to 101° F, except for the last two days of life when it rose to 104° to 106° F. The pulse also rose terminally. There were no abnormal laboratory findings which might have been pertinent to the patient's neurological disorder. Examinations of the cerebrospinal fluid on December 18, 1944 and on April 4, 1945 were normal.

Differential Diagnosis

Dr. Howard D. McIntyre: The diagnosis would appear to depend on whether one could interpret this disease as remitting or consistently progressive. One instance in the protocol that indicates the former, might be the remission in the early eye symptoms. The diagnoses to be considered are acute multiple sclerosis, amyotrophic lateral sclerosis, glioma of the pons, and syringobulbia.

Let us consider acute multiple sclerosis. The patient was told he had nystagmus and that it improved. Later the abdominal reflexes improved, which may be remission or faulty clinical interpretation. Another point in favor of multiple sclerosis was the notation in the Columbus hospital of bitemporal pallor of the optic discs. The examination at Cincinnati did not bear out this observation, so we may be able to dismiss it. The speech difficulty may have been bulbar in type or possibly it was scanning speech. As events proceeded, I think we can say it was bulbar; and the speech disturbance certainly was progressive rather than episodic. Against the diagnosis of multiple sclerosis is the fact that this patient had no sensory symptoms until late in his disease.

Let us consider the diagnosis of amyotrophic lateral sclerosis for which a good case can be made, since the patient had a progressive bilateral pyramidal tract disease associated with progressive bulbar palsy, and there were no sensory symptoms. There are few diseases that produce this combination. An objection to the diagnosis of amyotrophic lateral sclerosis is the fact that a considerable clinical observation did not note fibrillary twitching. The patient described twitching all over his body but no mention was made of it by clinicians. Another point not prohibitive of the diagnosis was the rather rapid progression of this disease. No mention was made about atrophy of the small muscles of the hands; atrophy of the musculature of the left shoulder may have been disuse atrophy or atrophy associated with amyotrophic lateral sclerosis.

The segmental redness of the chest is interesting; I would say this evidence of sympathetic disturbance was due to involvement

of fibers as they descend in the pons or medulla. It is usual to see movement in hemiplegic limbs during yawning. Yawning normally is a deep inspiration associated with opening of the jaw and stretching of the extremities; with pyramidal tract lesion this associated movement may be retained.

Throughout my consideration of the case I have been puzzled to explain the cerebellar symptoms,—the scanning speech, the ataxia, and the nystagmus. My diagnosis of amyotrophic lateral sclerosis is probably too heavily weighted by three factors, the bilateral pyramidal tract disease associated with bulbar palsy and the absence of sensory signs. In syringobulbia we would expect to find some disturbance in the function of the fifth nerve.

Discussion of Pathology

Dr. I. Mark Scheinker: The appearance of both hemispheres was normal; there was a pronounced diffuse enlargement of the entire pons, but no circumscribed tumor formation. On coronal sections the pons and midbrain appeared to be about twice the normal size. A similar enlargement was seen in the right peduncular region. In the involved areas the configuration was well preserved.

Also under low magnification the structure of the nervous tissue of the pons and midbrain was preserved, except for an excess cellularity and vacuole formation. Under higher magnification there were seen numerous glial nuclei which varied greatly in size and shape, diffusely scattered in the pons and midbrain. There were polygonal, elongated, round and lobulated forms with scanty and ill-defined cytoplasm. Processes occasionally could be found arising from one or both poles of some cells. In some areas, especially in the pons, there were streams of elongated cells composed predominantly of polar spongioblasts. These cells were so arranged between the nerve cells that the general structure of the tissue appeared almost normal. No mitotic figures were seen. In addition to increased cellularity, there was rarefaction of the tissue because of the formation of numerous small and large vacuoles.

Special stains showed a striking loss of myelin sheaths with resultant diffuse pallor of the involved areas. Only at the periphery were there to be seen a few myelin sheaths and they were degenerated; they showed irregular swelling and beading. In contradistinction to the far advanced myelin sheath destruction, the nerve cells and fibers were relatively well preserved. In preparations stained with silver impregnation (Bodian), the majority of the axis-cylinders showed normal stainability and well preserved structure. Only occasional irregularly impregnated and slightly degenerated axones were disclosed.

In sections stained with cresyl violet stain the large majority of nerve cells was found to be well preserved. Only in those areas where the tissue rarefaction was especially pronounced, did the number of nerve cells appear to be reduced. In preparations stained with scarlet red, occasional macrophages were seen, especially in the vicinity of some of the blood vessels. They harbored a small amount of fat. No changes were seen in the blood vessels or in the meninges, nor were there signs of an inflammatory reaction.

We are dealing with diffuse cerebral glioblastosis which was first described in 1936.[1] In the first case the change was noted chiefly in the brain stem. In other cases the same pathologic change has been found in the cerebral hemisphere.[2,3] In 1939 I observed six cases in the Neurological Clinic of the Salpetriere Hospital in Paris. In 1943 three more cases were reported and the relationship between diffuse cerebral glioblastosis and the large group of intracranial tumors was discussed.[4] Since this description ten additional cases have been observed in this clinic.

Grossly there is diffuse enlargement of affected regions with preservation of their general configuration, and there is no demarcation between normal and affected areas. There occurs a blastomatous proliferation of the glia along the pathways of the nervous tissue with preservation of its normal structure, and an extensive destruction of the myelin sheaths with relatively slight damage to axis cylinders and nerve cells. There are no signs of secondary degeneration.

The clinical recognition of the process is difficult. In cases in which the disease affects the brain stem, multiple sclerosis may be simulated. In contradistinction to multiple sclerosis, the clinical course in diffuse cerebral glioblastosis is less likely to be attended by

remissions and once manifested it is more rapid. In cases with hemispheral localization of the morbid process, epileptiform seizures and mild mental disturbances may dominate the clinical picture for years. The occasional development of increased intracranial pressure in the later stages may suggest neoplasm.

Clinical Diagnosis

Disseminated sclerosis.

Doctor McIntyre's Diagnosis

Amyotrophic lateral sclerosis.

Anatomical Diagnosis

Diffuse glioblastosis of the midbrain and pons.
Multiple pulmonary infarctions.
Pulmonary edema.
Lobular pneumonia.

Dr. Charles D. Aring: Doctor Scheinker, would you like to comment on the etiology of this process?

Dr. Scheinker: It does not show the characteristics of neoplasm and one does not find mitotic figures or destruction of tissue. I really do not know the etiology. It might be a congenital anomaly with later proliferation of glia occurring due to unknown causes.

In cases in which we see glial proliferation we are more and more inclined to think not in terms of congenital anomaly, but rather in terms of vascular disturbance. There is evidence that a certain amount of hypoxia is required to stimulate proliferation of glia. If anoxia is complete then we see softening, everything is destroyed. If hypoxia is mild it may not be enough to destroy glia, while it may destroy myelin. In fact, hypoxic stimulation of glia may be found in several diseases, which we are now studying. I would be inclined to think, tentatively of course, that diffuse glioblastosis might be stimulated by a vascular disturbance that results in stimulation of glia.

Dr. Aring: In this clinic we are always interested in vascular explanations for neurological disease. One should carefully examine the smaller vessels particularly the veins in diffuse glioblastosis. From work done by Hurst[5] we have learned that repeated doses of hypoxia result in myelin sheath deterioration.

There is a point to be made about increased intracranial pressure in brain stem gliomas and glioblastosis. It may not be seen until late, since it depends on the blockage of cerebrospinal pathways, and not merely on the increase of intracranial content.

Dr. Samuel Feinberg: Did the patient have true or pseudobulbar palsy?

Dr. Aring: I think it was pseudobulbar (supranuclear) palsy.

Dr. Scheinker: Pathologically he didn't have true bulbar palsy and the pyramidal tracts were demyelinated.

Dr. McIntyre: It is hard to imagine how there could have been so much change and no sensory findings.

Dr. Scheinker: I think the explanation is that so many nerve fibers were preserved.

Dr. Aring: When the diagnosis of disseminated sclerosis was thought to have been established up-State, the patient was given several courses of histamine injections. It was after the fourth injection of this substance that the patient noted muscular twitching, and that he was told of the return of the abdominal reflexes and of the improving hand grip. The heights reached by the enthusiasms of physician and patient are on occasions, suprabiological. This is as good a place as any to warn the physician putting forward a treatment for disseminated sclerosis to pluck the mote from his own eye. Not only may his treatment be questioned, but so also his diagnosis.

It might also be noted that this poor patient was said to harbor the streptococcus with neurotropic properties and to be more sensitive to it than to other strains of streptococci, and this organism was postulated as the cause of his neurological disease which again was presumed to be disseminated sclerosis. He was divested of certain of his nasopharyngeal bacteria and neurotropism was being proved in culture studies until the nature of the pathological findings transcended the boundaries of our laboratory. This put an immediate end to this hokus-pokus, which would appear to indicate that there are at large some preconceived notions about the function of the "neurotropic streptococcus".

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Newsnotes

SCHERING AWARD FOR MEDICAL STUDENTS

The Schering Award for 1946, a competition open to undergraduate medical students, has recently been announced. Held annually to encourage medical students to acquire further knowledge of various fields of endocrinology, the subject of this year's thousand dollar prize contest will be, "The Role of Hormones in Sterility". Three judges, each prominent in the field of endocrinology, will make the selections, and the award is sponsored by Schering Corporation of Bloomfield, New Jersey, manufacturers of endocrine and pharmaceutical products for the medical profession. For the best thesis submitted on the subject, an award of five hundred dollars will be given. For the second and third best papers, awards of three hundred and two hundred dollars, respectively, will be given.

SOUTHERN PSYCHIATRIC ASSOCIATION MEETING RESUMED

The Southern Psychiatric Association will hold its annual session at the Jefferson Hotel in Richmond, Virginia, on October 7 and 8. The last meeting of the Association was held in Nashville, Tennessee, in 1941, under the presidency of Dr. Arthur J. Schwenkenberg of Dallas, Texas. The present officers of the Association are:

Whitman C. McConnell, M.D.,
St. Petersburgh, Florida, President.

James K. Hall, M.D.
Richmond, Virginia, President Elect.

Edmund McC. Connelly, M.D.
New Orleans, Louisiana, Vice President.

Arthur J. Schwenkenberg, M.D.
Dallas, Texas, Councillor.

John S. Hickman, M.D.
Meridian, Mississippi, Councillor.

Newdigate M. Owensby, M.D.
Atlanta, Georgia, Secretary-Treasurer.

NEW ADDRESS OF AMERICAN BOARD OF PSYCHIATRY & NEUROLOGY

The Executive Offices of the American Board of Psychiatry and Neurology, Inc., formerly in Washington, D. C., are now located at 102-110 Second Avenue, S. W., Rochester, Minnesota. Dr. Francis J. Braceland is the new secretary of the Board.

The next meeting of the Board will be held in New York City on December 16th and 17th, 1946. All applications for examination should be completed and in the hands of the secretary by October 6th, 1946. The December meeting of the Board is the last opportunity for the consideration of candidates who desire certification upon record.

TWIN ELMS

A Modern Psychiatric Unit

Selected drug and alcohol problems welcome.

Rates moderate.

EUGENE N. BOUDREAU, M.D., *Psychiatrist*
R. STUART DYER, M.D., *Assistant Psychiatrist*

SYRACUSE, N. Y.